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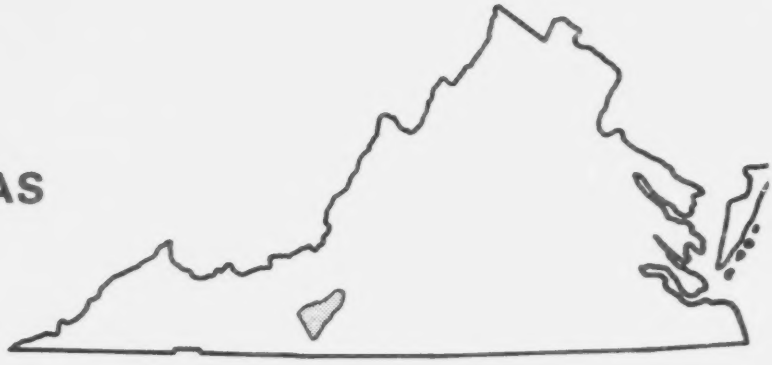
FLOOD INSURANCE STUDY

FLOYD COUNTY, VIRGINIA
UNINCORPORATED AREAS



SEPTEMBER 29, 1989

Federal Emergency Management Agency

COMMUNITY NUMBER - 510199

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program (NFIP) have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

Part or all of this FIS may be revised and republished at any time. In addition, part of this FIS may be revised by the Letter of Map Revision (LOMR) process, which does not involve republication or redistribution of the FIS. It is, therefore, the responsibility of the user to consult with community officials and to check the community repository to obtain the most current FIS components.

Initial Flood Insurance Study Effective Date: September 29, 1989

Flood Insurance Study Revised:

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Flood Insurance Rate Map

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FLOOD INSURANCE STUDY
FLOYD COUNTY, UNINCORPORATED AREAS, VIRGINIA

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study investigates the existence and severity of flood hazards in the unincorporated areas of Floyd County, Virginia, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates and assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the state (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were prepared by the U. S. Geological Survey (USGS) for the Federal Emergency Management Agency (FEMA), under Inter-Agency Agreement No. EMW-85-1823. This work was completed in February 1988.

1.3 Coordination

On January 22, 1985, an initial Consultation and Coordination Officer's (CCO) meeting was held with representatives of FEMA, the county, and the USGS (the study contractor) to determine the streams to be studied by detailed methods.

On August 10, 1988, a final CCO meeting was held with representatives of FEMA, the county, and the study contractor to review the results of the study.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the unincorporated areas of Floyd County, Virginia. The Town of Floyd is not included in this study. The area of study is shown on the Vicinity Map (Figure 1).

The Little River was studied by detailed methods from approximately 1.0 mile downstream of State Route 787 to approximately 1,200 feet upstream of Old Mill Dam, from approximately 4.4 miles upstream of State Road 617 extending approximately 3,300 feet upstream, and from approximately 0.7 mile downstream of U. S. Route 221 to approximately 0.6 mile upstream of U. S. Route 221. Dodd Creek was studied by detailed methods from its confluence with the West Fork Little River to approximately 1,700 feet upstream of State Highway 8, and from approximately 600 feet downstream of U. S. Route 221 extending upstream to State Road 720. The West Fork Little River was studied by detailed methods from approximately 0.7 mile downstream of State Highway 8 to approximately 0.8 mile upstream of State Highway 8. Pine Creek was studied by detailed methods from approximately 1,400 feet downstream of U. S. Route 221 to approximately 800 feet upstream of State Road 860. Meadow Run was studied by detailed methods from approximately 1,450 feet downstream of State Road 642 to approximately 1,050 feet upstream of U. S. Route 221. The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction through February 1993.

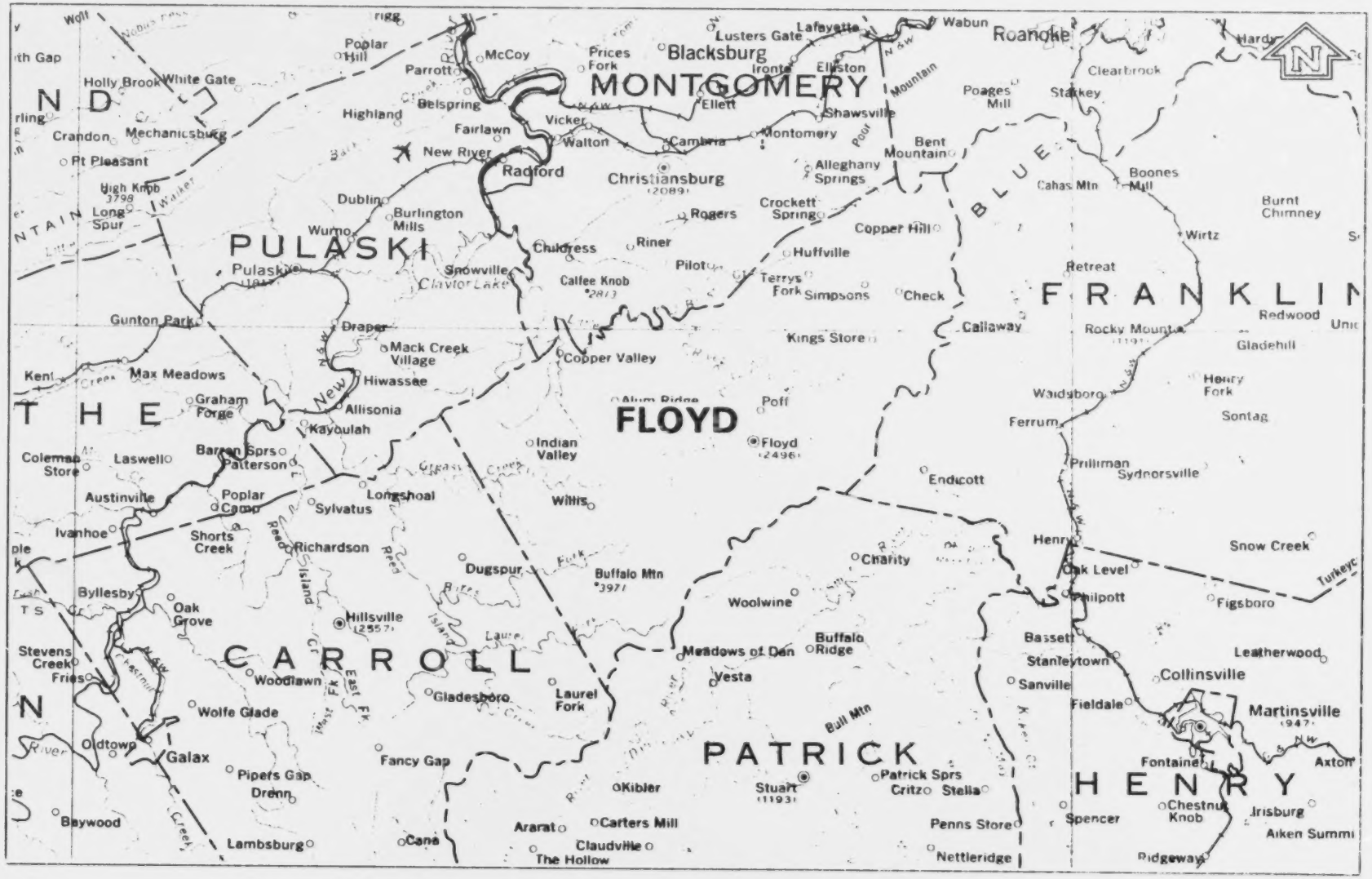
Goose Creek, Burks Fork, and the remaining portions of the Little River and the West Fork Little River were studied by approximate methods. Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon by, FEMA and Floyd County.

2.2 Community Description

Floyd County is located in southwestern Virginia. It is bordered by Montgomery and Roanoke Counties to the north, Franklin County to the east, Patrick and Carroll Counties to the south, and Pulaski County to the west.

2.3 Principal Flood Problems

Flooding in Floyd County results from streams overflowing their banks caused by runoff from heavy rains from tropical storms or major weather fronts. Streams on which economic damage occurs from flooding include the Little River and its tributaries. Floods have occurred on the Little River in 1940, 1959, 1972, and 1985.


MONTGOMERY
PULASKI
FLOYD
CARROLL
PATRICK
FRANKLIN
HENRY
BLUE
Blacksburg
Roanoke
Christiansburg
Radford
New River
Fairlawn
Dublin
Burlington Mills
Wurno
Snowville
Claytor Lake
Pulaski
Draper
Mack Creek Village
Copper Valley
Hiwassee
Allisonia
Kayoulah
Graham Forge
Max Meadows
Gunton Park
Kent
Barren Sprs
Patterson
Laswell
Coleman Store
Austinville
Poplar Camp
Longshoal
Sylvatus
Ivanhoe
Shorts Creek
Richardson
Byllesby
Oak Grove
Hillsville
Stevens Creek
Fries
Woodlawn
Wolfe Glade
Oldtown
Galax
Pipers Gap
Drenn
Baywood
Lambsburg
Fancy Gap
Cana
Gladesboro
Laurel Fork
Dugspur
Buffalo Mtn
Willis
Indian Valley
Floyd
Poff
Alum Ridge
Kings Store
Callaway
Endicott
Ferrum
Prillaman
Sydnorsville
Waidsboro
Henry Fork
Sontag
Gladehill
Rocky Mount
Redwood
Wirtz
Burnt Chimney
Boones Mill
Cahas Mtn
Bent Mountain
Alleghany Springs
Crockett Springs
Copper Hill
Huffville
Retreat
Check
Simpsons
Terrys Fork
Pilot
Callee Knob
Riner
Childress
Rogers
Montgomery
Cambria
Walton
Vicker
Belspring
Highland
Parrott
McCoy
Prices Fork
Ellett
Shawsville
Ironto
Ellston
Lafayette
Lusters Gate
Wabun
Poages Mill
Starkey
Clearbrook
Hardy
Holly Brook
White Gate
Crandon
Mechanicsburg
Pt Pleasant
High Knob
Long Spur
Poplar Hill
Woolwine
Meadows of Dan
Buffalo Ridge
Vesta
Bull Mtn
Kibler
Stuart
Patrick Sprs
Critzo
Stella
Ararat
Carters Mill
Claudville
The Hollow
Penns Store
Nettleridge
Spencer
Chestnut Knob
Irisburg
Aiken Summit
Ridgeway
Fieldale
Martinsville
Collinsville
Leatherwood
Stanleytown
Bassett
Figsboro
Snow Creek
Oak Level
Philpott
Henry
Charity
Turkeyc
Fontaine
Axton
Sanville
Bassett
Oak Level
Philpott
Figsboro
Snow Creek
Leatherwood
Collinsville
Martinsville
Fieldale
Stanleytown
Sanville
Fontaine
Axton
Chestnut Knob
Irisburg
Aiken Summit
Ridgeway
Spencer
Penns Store
Nettleridge
Patrick Sprs
Critzo
Stella
Stuart
Kibler
Ararat
Carters Mill
Claudville
The Hollow
Cana
Lambsburg
Fancy Gap
Pipers Gap
Drenn
Baywood
Oldtown
Galax
Wolfe Glade
Woodlawn

The largest flood recorded since 1928 at the USGS stream gaging station 03170000 Little River at Graysonton occurred June 21, 1972. The maximum elevation of this flood was 1,829.4 feet NGVD with a discharge of 22,800 cfs. This flood had a recurrence interval of about 50 years, or a 1 in 50 chance, on the average, of occurring in any given year. The second highest flood recorded at Graysonton occurred September 30, 1959, with a discharge of 18,500 cfs and had a recurrence interval of 25 years. Other floods were August 14, 1940 with a discharge of 17,700 cfs, and November 5, 1985 with a discharge of 18,200 cfs. These floods have caused widespread damage to private, commercial, and public property in Floyd County.

2.4 Flood Protection Measures

No flood control measures have been taken to alleviate flooding within Floyd County.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the county, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude which are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (1 percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each flooding source studied in detail affecting the county.

The flood-frequency discharge values for the Little River (Lower Reach), from the downstream county boundary to approximately 100 feet downstream of State Route 617, were obtained from the Flood Insurance Study for the unincorporated areas of Montgomery County (Reference 1). In that study, the discharges were determined using the log-Pearson Type III distribution method (Reference 2).

Flow records at gaging stations on streams in the area and equations developed by Miller (1978) are combined using a weighting method (Carpenter, 1983) for estimating peak flows for the 100-year flood (References 3 and 4). Weighted estimates of the 100-year flood discharge for each stream reach studied in Floyd County were calculated. The results are provided in Table 1, "Summary of Discharges."

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGE (cfs) 100-YEAR
LITTLE RIVER		
At Graysonton (gage no. 03170000)	300	25,000
At Sowers	190	19,900
At State Road 617 near Floyd	184	19,900
Below State Road 706 near Floyd	183	19,900
At Woods Store	61.0	10,000
Near Woods Store	58.5	9,840
DODD CREEK		
Above the West Fork Little River near Floyd	22.3	5,440
Above State Highway 8 near Floyd	20.3	5,160
Below U. S. Route 221 near Floyd	19.0	5,140
Above State Road 720 near Floyd	17.2	4,840
WEST FORK LITTLE RIVER		
Below State Highway 8 near Floyd	68.8	12,200
Above State Highway 8 near Floyd	44.6	9,020
PINE CREEK		
Below U. S. Route 221 near Floyd	9.68	3,210
Above State Road 860 near Floyd	4.33	2,010
MEADOW RUN		
Near Check	3.88	1,820
At Check	1.87	1,120

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

Backwater analysis was done from cross sections surveyed in the field by transit stadia survey methods. These sections were extended in some cases by measurements taken from topographic maps. Sections were surveyed at intervals of about 3 or 4 per mile except in the case of bridges where sections were surveyed as required for bridge computations.

Channel roughness factors (Manning's "n") used in hydraulic computations were assigned on the basis of engineering judgment and field inspection of the floodplain areas in the field, at the time the cross sections were surveyed. Sections were subdivided as needed to account for large changes in channel geometry or roughness. The channel "n" values selected ranged from 0.035 to 0.150 (Reference 5).

Elevations of the water surface for the 100-year flood were computed by WSPRO, a computer program for step-backwater analysis developed by the USGS for the Federal Highway Administration (Shearman, 1985 (References 6, 7, and 8). The program computes the water-surface elevation by step-backwater computations given either the starting elevation, determined from the stage-discharge relationship at a gaging station, or slope-conveyance, determined from the channel slope. Water-surface elevations used to define the 100-year flood elevation at each section are the actual water-surface elevations computed by the program or in the case of supercritical flow, the water-surface elevation used was that of critical flow.

Profiles of the 100-year flood were drawn showing the computed water-surface elevation to an accuracy of 0.5 foot. The profiles show the streambed and location of bridges, cross sections, and confluence of tributaries.

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD). Elevation reference marks used in this study are shown on the maps; the descriptions of the marks are presented in Elevation Reference Marks (Exhibit 3).

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each Flood Insurance Study provides 100-year flood elevations and delineations of the 100-year floodplain boundaries to assist communities in developing floodplain management measures.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1 percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. For the streams studied in detail, the 100-year floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated

using topographic maps at a scale of 1:24,000 with a contour interval of 20 feet (Reference 9).

For the streams studied by approximate methods, the floodplain boundaries were delineated using the Flood Hazard Boundary Map for Floyd County (Reference 10).

The 100-year floodplain boundaries are shown on the Flood Insurance Rate Map (Exhibit 2). On this map, the 100-year floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE). Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the National Flood Insurance Program, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 100-year floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights. Minimum federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced.

The floodway presented in this study was computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections (Table 2). The computed floodway is shown on the Flood Insurance Rate Map (Exhibit 2). In cases where the floodway and 100-year floodplain boundaries are either close together or collinear, only the floodway boundary is shown. Floodway information has not been determined for Floyd County. Floodway information for the Little River (Lower Reach) has been taken from the Flood Insurance Study for the unincorporated areas of Montgomery County (Reference 1).

The area between the floodway and 100-year floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood by more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 2.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Little River (Lower Reach)								
A	83,820	300/80[2]	3,697	6.9	1,911.0	1,911.0	1,911.0	0.0
B	90,150	230/155[2]	2,441	10.0	1,918.0	1,918.0	1,918.3	0.3
C	100,000	250/155[2]	2,432	10.0	1,971.2	1,971.2	1,971.3	0.1
D	110,570	185/105[2]	2,860	8.5	2,009.8	2,009.8	2,010.0	0.2
E	121,410	235/80[2]	3,681	6.6	2,027.4	2,027.4	2,027.6	0.2
F	128,730	195/70[2]	3,081	7.9	2,035.4	2,035.4	2,035.5	0.1
G	140,690	335/155[2]	2,441	9.5	2,057.0	2,057.0	2,057.0	0.0
H	152,300	255/145[2]	3,894	6.0	2,075.8	2,075.8	2,076.1	0.3
I	166,800	215/140[2]	3,771	6.2	2,087.9	2,087.9	2,087.9	0.0
J	171,650	195/60[2]	3,665	6.1	2,091.3	2,091.3	2,091.5	0.2

[1] Feet above mouth
[2] Width/width within corporate limits

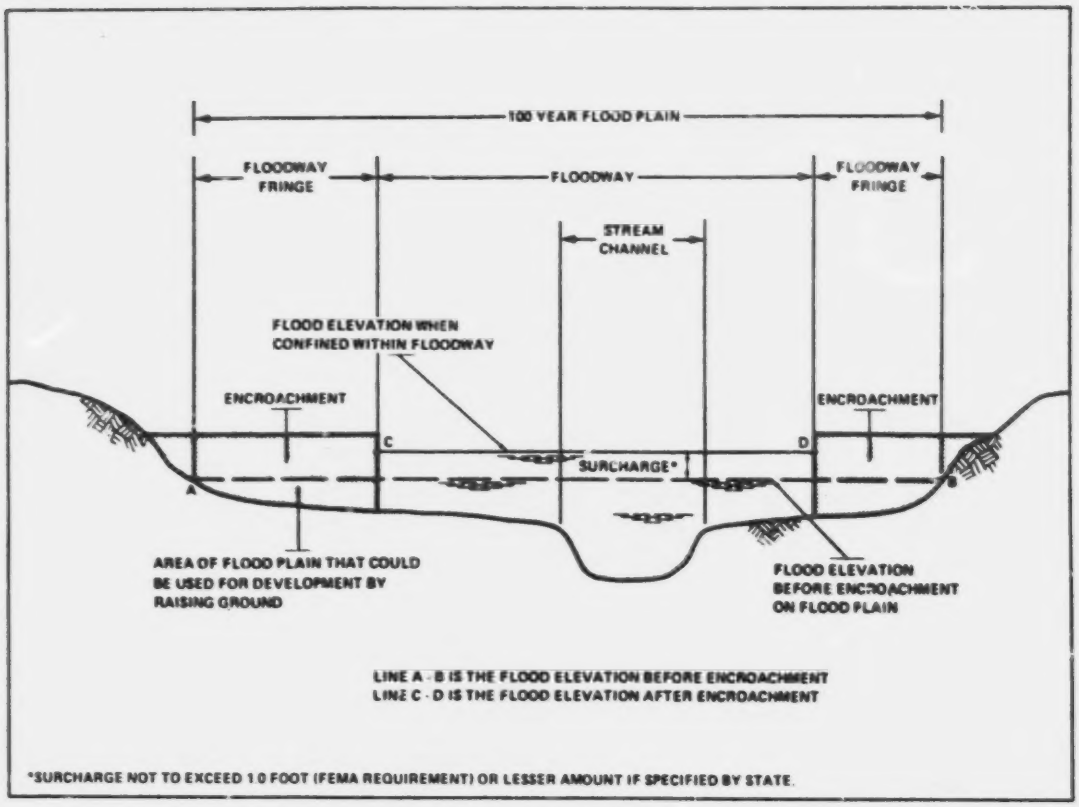
TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

FLOYD COUNTY, VA
(UNINCORPORATED AREAS)

FLOODWAY DATA

LITTLE RIVER (LOWER REACH)


100 YEAR FLOOD PLAIN
FLOODWAY FRINGE
FLOODWAY
FLOODWAY FRINGE
STREAM CHANNEL
FLOOD ELEVATION WHEN CONFINED WITHIN FLOODWAY
ENCROACHMENT
ENCROACHMENT
C
D
SURCHARGE*
A
B
AREA OF FLOOD PLAIN THAT COULD BE USED FOR DEVELOPMENT BY RAISING GROUND
FLOOD ELEVATION BEFORE ENCROACHMENT ON FLOOD PLAIN
LINE A - B IS THE FLOOD ELEVATION BEFORE ENCROACHMENT
LINE C - D IS THE FLOOD ELEVATION AFTER ENCROACHMENT
*SURCHARGE NOT TO EXCEED 1.0 FOOT (FEMA REQUIREMENT) OR LESSER AMOUNT IF SPECIFIED BY STATE.

FLOODWAY SCHEMATIC Figure 2

5.0 INSURANCE APPLICATIONS

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. The zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by detailed methods. In most instances, whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AH

Zone AH is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-depths derived from the detailed hydraulic analyses are shown within this zone.

Zone A99

Zone A99 is the flood insurance rate zone that corresponds to areas of the 100-year floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or depths are shown within this zone.

Zone V

Zone V is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Because approximate hydraulic analyses are performed for such areas, no base flood elevations are shown within this zone.

Zone VE

Zone VE is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 500-year floodplain, areas within the 500-year floodplain, and to areas of 100-year flooding where average depths are less than 1 foot, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within this zone.

Zone D

Zone D is the flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

6.0 FLOOD INSURANCE RATE MAP

The Flood Insurance Rate Map is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 100-year floodplains that were studied by detailed methods, shows selected whole-foot base flood elevations or average depths. Insurance agents use the zones and base flood elevations in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 100-year floodplain. The locations of selected cross sections used in the hydraulic analyses are shown where applicable.

7.0 OTHER STUDIES

A Flood Insurance Study has been prepared for the unincorporated areas of Montgomery County (Reference 1). The results of this study are in agreement with the results of that study.

Due to its more detailed nature, this study supersedes the Flood Hazard Boundary Map for the unincorporated areas of Floyd County (Reference 10).

8.0 LOCATION OF DATA

Information concerning the pertinent data used in preparation of this study can be obtained by contacting FEMA, the Natural and Technological Hazards Division, Liberty Square Building (Second Floor), 105 South Seventh Street, Philadelphia, Pennsylvania 19106.

9.0 BIBLIOGRAPHY AND REFERENCES

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2. Water Resources Council, "Guidelines for Determining Flood Flow Frequency," Bulletin 17, Washington, D. C., March 1976.

3. U. S. Geological Survey, Water Resources Investigations Report 78-5, Technique for Estimating Magnitude and Frequency of Floods in Virginia, E. M. Miller, 1978.

4. U. S. Geological Survey and Maryland Department of Natural Resources Report of Investigations No. 35, Characteristics of Streamflow in Maryland, D. H. Carpenter, 1983.

5. U. S. Federal Highway Administration, Report No. FHWA-TS-84-202, Guide for Selecting Manning's Roughness Coefficients for Natural Channels and Floodplains, 1984.

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7. U. S. Federal Highway Administration Report FHWA/RD-86/108, Bridge Waterways Analysis Model/Research Report, J. O. Shearman, W. H. Kirby, V. R. Schneider, and H. N. Flippo, Jr., 1986.

8. U. S. Geological Survey and the Federal Highway Administration, WSPRO User's Manual, J. O. Shearman and others (Unpublished).

9. U. S. Department of the Interior, Geological Survey, 7.5-Minute Series Topographic Maps, Scale 1:24,000, Contour Interval 20 Feet: Floyd, Virginia, 1968; Endicott, Virginia, 1967; Alum Ridge, Virginia, 1968; Check, Virginia, 1963; Riner, Virginia, 1965.

10. U. S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Hazard Boundary Map, Floyd County, Virginia, September 11, 1981.

EXHIBIT 3 - ELEVATION REFERENCE MARKS

Reference Mark	FIRM Panel	Elevation (Feet NGVD)	Description of Location
RM 1	50	2,131.010	Nail in base of 25-inch poplar tree, 7.8 miles northwest along State Highway 8 from Floyd, to intersection of State Highway 8 and State Road 617, 0.5 mile north along State Road 617 to intersection of State Roads 617 and 706, 0.4 mile along State Road 706 to intersection of State Road 706 and unnamed road, and 50 feet along State Road 706.
RM 2	50	2,122.565	Chiseled square on top of east end of 24-inch concrete culvert, 7.8 miles northwest along State Highway 8 from Floyd, to intersection of State Routes 8 and 617, 0.5 mile north along State Road 617 to intersection of State Roads 617 and 706, 0.4 mile along State Road 706 to intersection of State Road 706 and unnamed road, 75 feet along unnamed road.
RM 3	65	2,083.164	Standard tablet stamped TT STA NO 57 D 1930 set in concrete post, 4.2 miles south along State Highway 8 from Riner, Montgomery County, to junction of State Road 602, 1.4 miles southeast along State Road 602 to junction of State Road 617, 250 feet west of Brush Creek, 34 feet southwest of triangle, and 45 feet north of bridge over the Little River.
RM 4	65	2,085.285	Nail in northwest side of locust tree 1 foot above ground, 4.2 miles south along State Highway 8 from Riner, Montgomery County, to junction of State Road 602, 1.4 miles southeast along State Road 602 to junction of State Road 617, 0.1 mile southwest along State Road 617 to junction of State Road 663, 0.5 mile southeast along State Road 663, at southwest side of road.

EXHIBIT 3 - ELEVATION REFERENCE MARKS (continued)

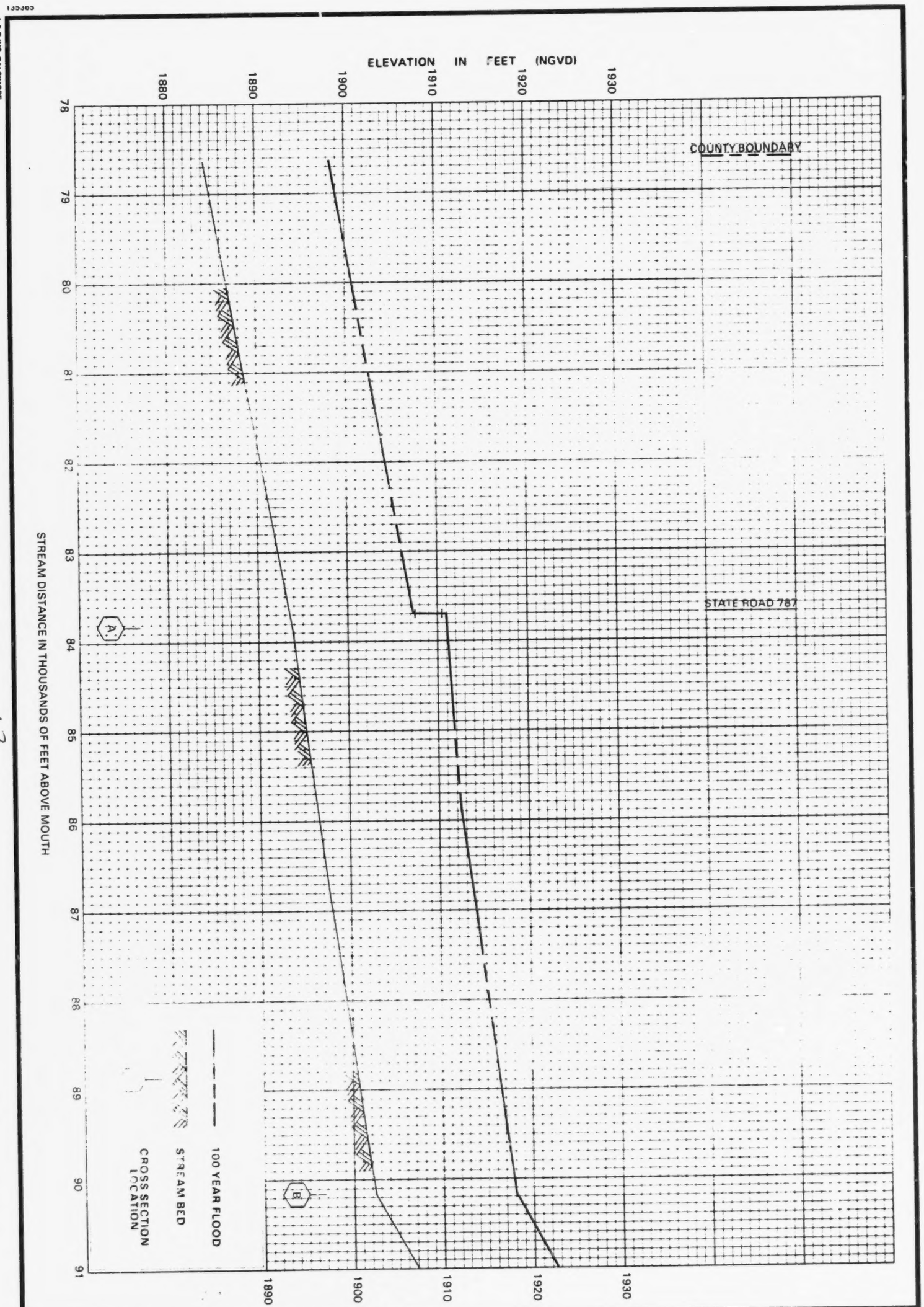
Reference Mark	FIRM Panel	Elevation (Feet NGVD)	Description of Location
RM 5	65	2,097.88	Chiseled square on west corner of concrete projection of old dam, 4.2 miles south along State Highway 8 from Riner, Montgomery County, to junction of State Road 602, 1.4 miles southeast along State Road 602 to junction of State Road 617, 0.1 mile southwest along State Road 617 to junction of State Road 663, 1.6 miles southeast along State Road 663, at old mill.
RM 6	65	2,107.48	Chiseled square on fourth slab of concrete riprap on culvert southwest of edge of pavement, 7.8 miles northwest along State Highway 8 from Floyd, to intersection of State Highway 8 and State Road 617, 0.5 mile north along State Road 617 to intersection of State Roads 617 and 706, 0.4 mile along State Road 706 to intersection of State Road 706 and unnamed road, and 0.5 mile along State Road 706 to culvert.
RM 7	90	2,520.810	Chiseled square on top of first guardrail post from southeast corner of U. S. Route 221 bridge over Meadow Run, at Check.
RM 8	90	2,483.305	Chiseled square on top of wing wall at southeast corner of State Road 642 bridge over Meadow Run, 0.4 mile southeast along State Road 642 from Check.
RM 9	155	2,165.81	Chiseled square near center of concrete roadway at northeast end of bridge, 2.5 miles northwest along State Highway 8 from Floyd, to private road on southwest side of State Route 8, 0.3 mile along private road to the West Fork Little River.
RM 10	155	2,177.580	Chiseled square on top of wing wall at northeast corner of bridge, 2.3 miles northwest along State Highway 8 from Floyd to the West Fork Little River.

EXHIBIT 3 - ELEVATION REFERENCE MARKS (continued)

Reference Mark	FIRM Panel	Elevation (Feet NGVD)	Description of Location
RM 11	155	2,188.785	Standard disk stamped X 60 1935 set in top of concrete post, 1.7 miles northwest along State Highway 8 from Floyd, to intersection of State Highway 8 and State Road 813, 55 yards northwest along State Highway 8, and 47 feet southwest of centerline of highway.
RM 12	155	2,251.965	Chiseled square on top of wing wall at southeast corner of bridge over Dodd Creek, 1.1 miles southwest along U. S. Route 221 from Floyd.
RM 13	155	2,262.155	Chiseled square on top of wing wall at northwest corner of bridge over Dodd Creek, 0.6 mile southwest along U. S. Route 221 from Floyd, to intersection of U. S. Route 221 and State Road 720, southwest along State Road 720 to Dodd Creek.
RM 14	155	2,274.349	Standard tablet in concrete post stamped W 16 1939 2274, 2.6 miles northeast along U. S. Route 221 from Floyd, 24 feet northwest of centerline of U. S. Route 221, and 132 feet southwest of intersection of U. S. Route 221 and State Road 860.
RM 15	155	2,292.455	Chiseled square on southwest corner of culvert, 1.0 mile southeast along State Road 860 from intersection of U. S. Route 221 and State Road 860, to intersection of State Roads 860 and 690, 200 feet north along State Road 690, at culvert on Pine Creek.
RM 16	160	2,235.975	Chiseled square on 4 feet by 2 feet brown and white rock in old branch bed, most downstream of several smaller rocks, 0.4 mile southwest along U. S. Route 221 from Woods Store, 0.3 mile downstream along northeast bank, and 100 feet northeast of the Little River.

EXHIBIT 3 - ELEVATION REFERENCE MARKS (continued)

Reference Mark	FIRM Panel	Elevation (Feet NGVD)	Description of Location
RM 17	160	2,249.661	Standard tablet stamped TT 8 TWC 1947 2250 at Woods Store, in south end of east abutment of U. S. Route 221 bridge over the Little River.



FEDERAL EMERGENCY MANAGEMENT AGENCY

FLOYD COUNTY, VA
(UNINCORPORATED AREAS)

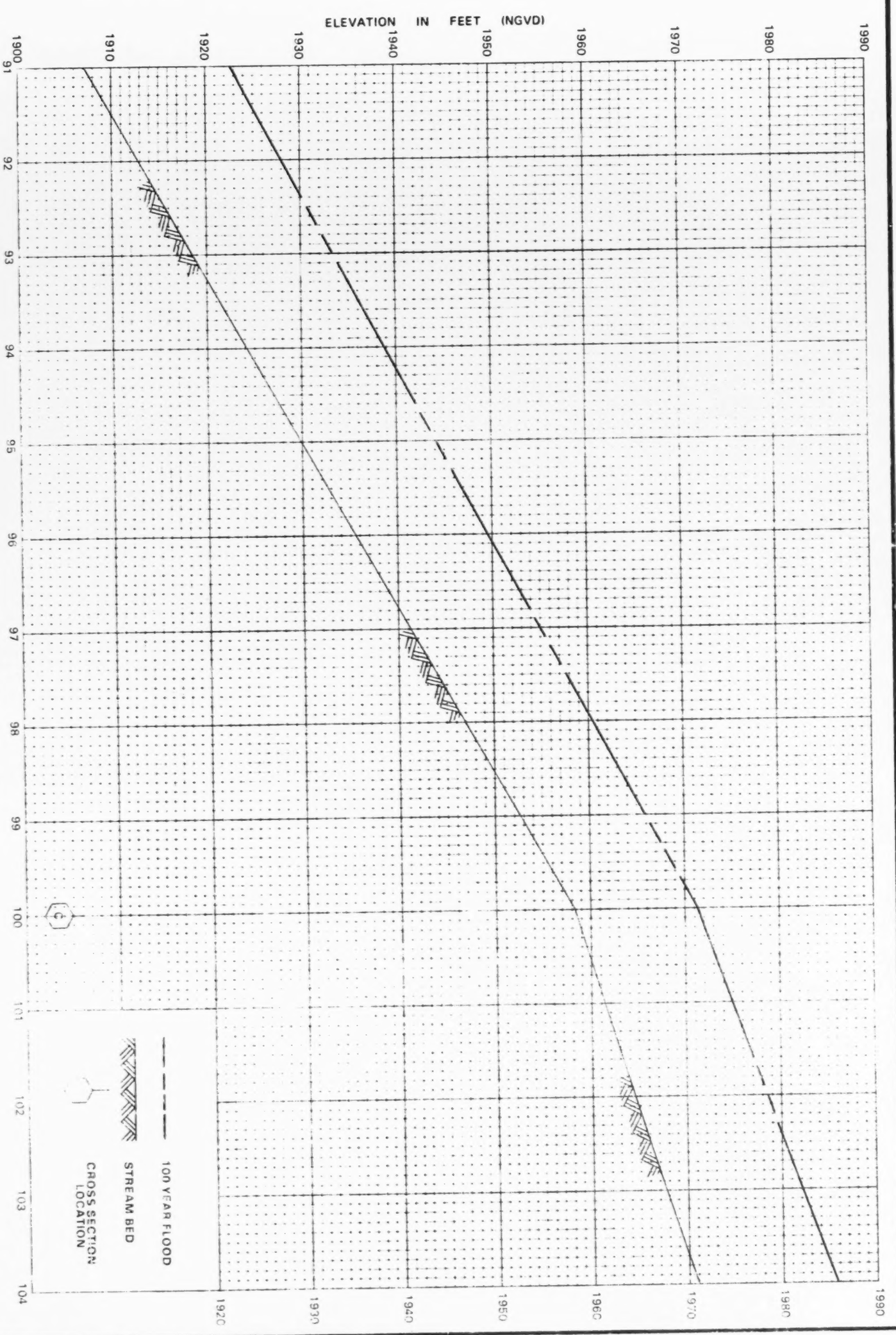
FLOOD PROFILES

LITTLE RIVER (LOWER REACH)

01P

135365

A & F INC BALTIMORE



FEDERAL EMERGENCY MANAGEMENT AGENCY

FLOYD COUNTY, VA
(UNINCORPORATED AREAS)

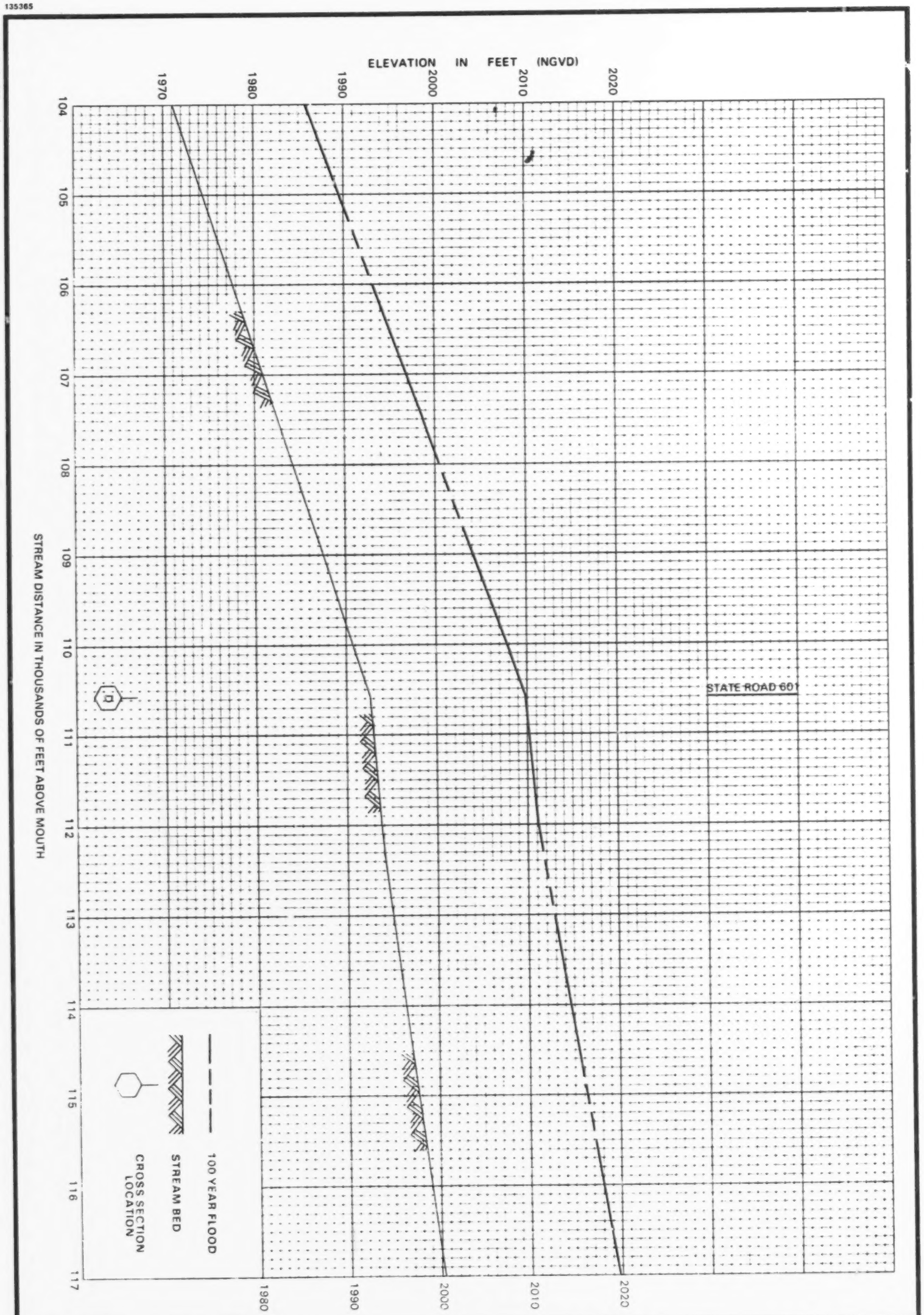
02P

FLOOD PROFILES

LITTLE RIVER (LOWER REACH)

135365

A & F INC BALTIMORE



FEDERAL EMERGENCY MANAGEMENT AGENCY

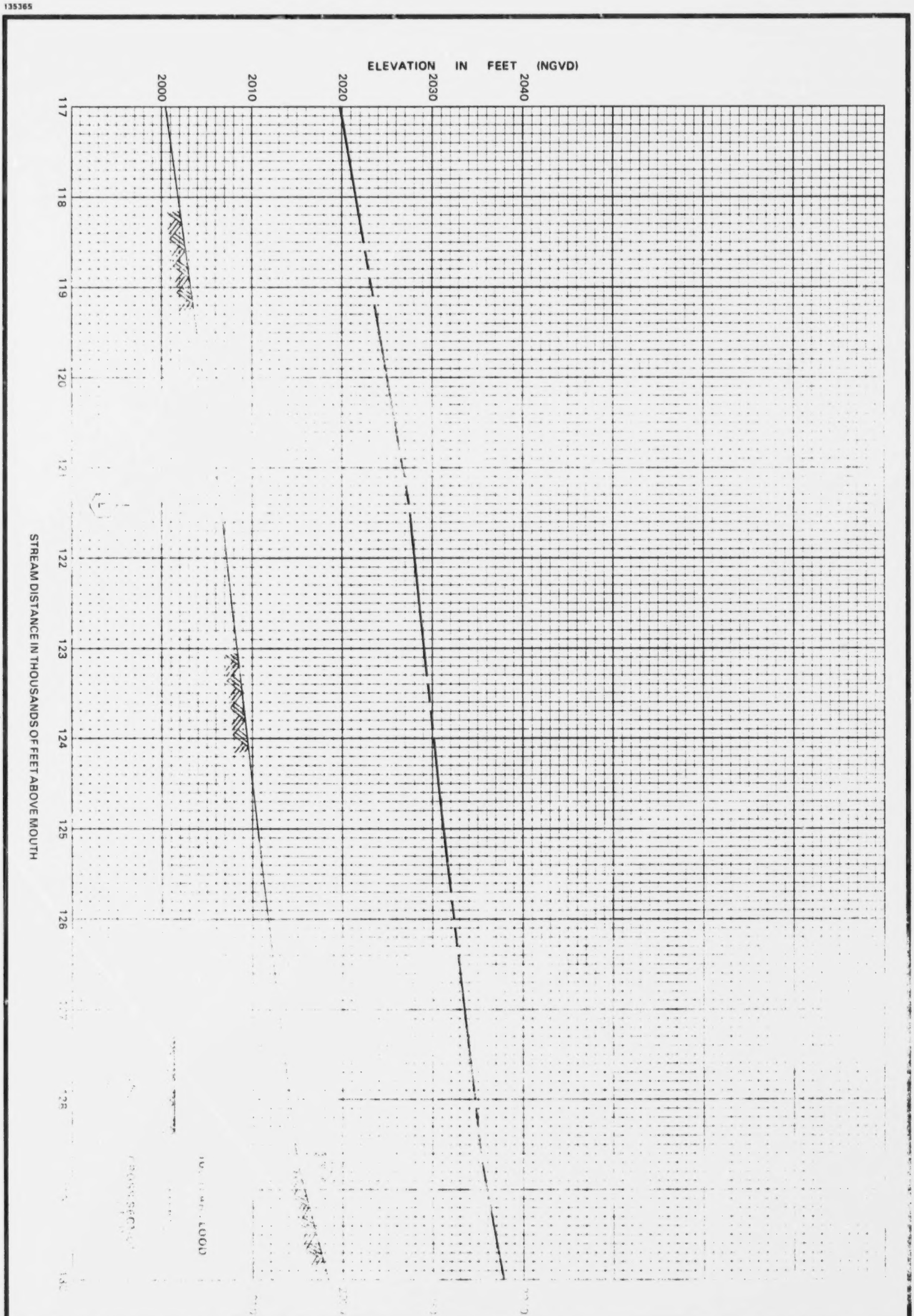
FLOYD COUNTY, VA
(UNINCORPORATED AREAS)

FLOOD PROFILES

LITTLE RIVER (LOWER REACH)

03P

135365



EMERGENCY MANAGEMENT AGENCY

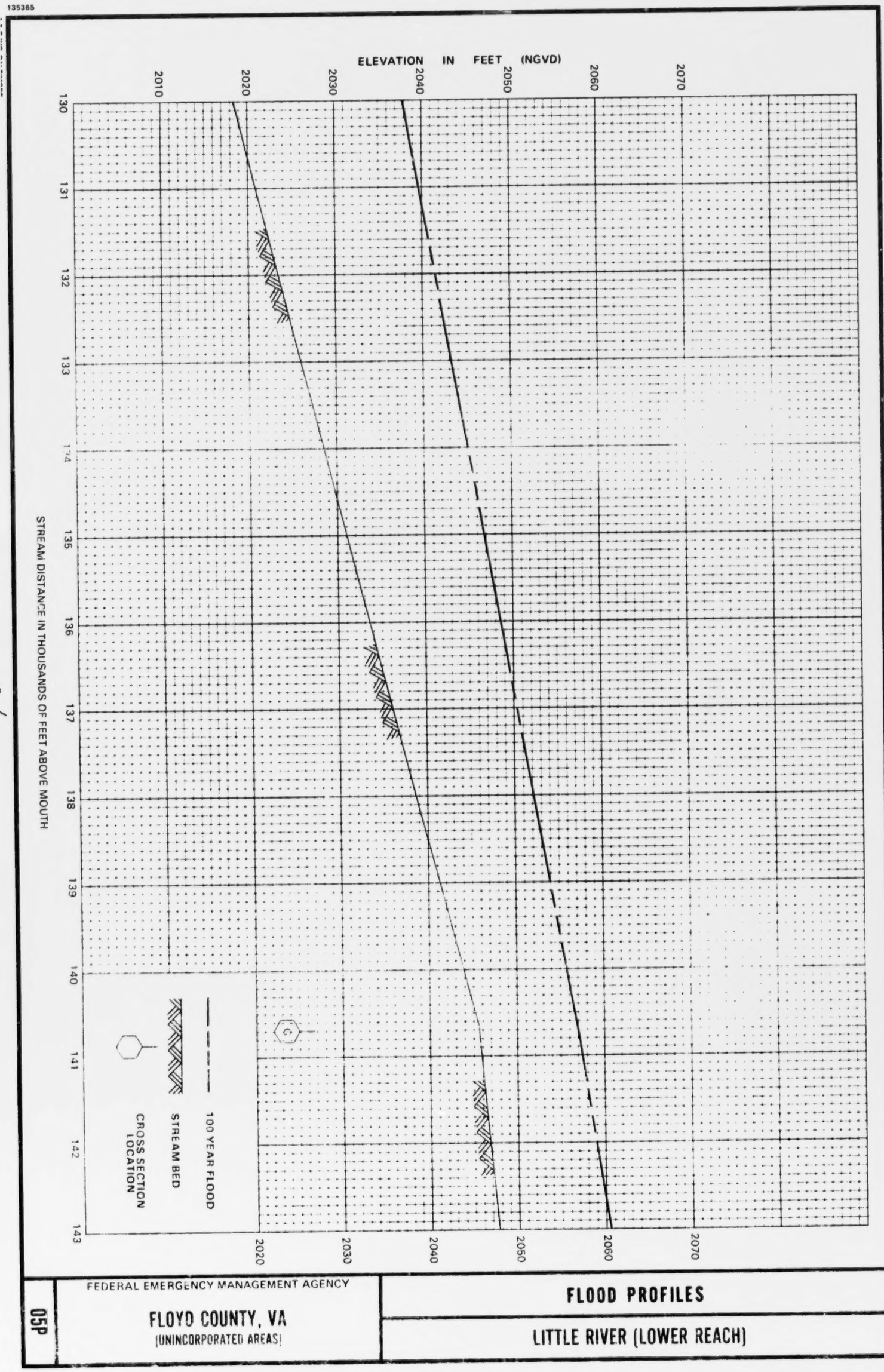
FLOYD COUNTY, VA
(UNINCORPORATED AREAS)

FLOOD PROFILES

LITTLE RIVER (LOWER REACH)

04P

135365



21

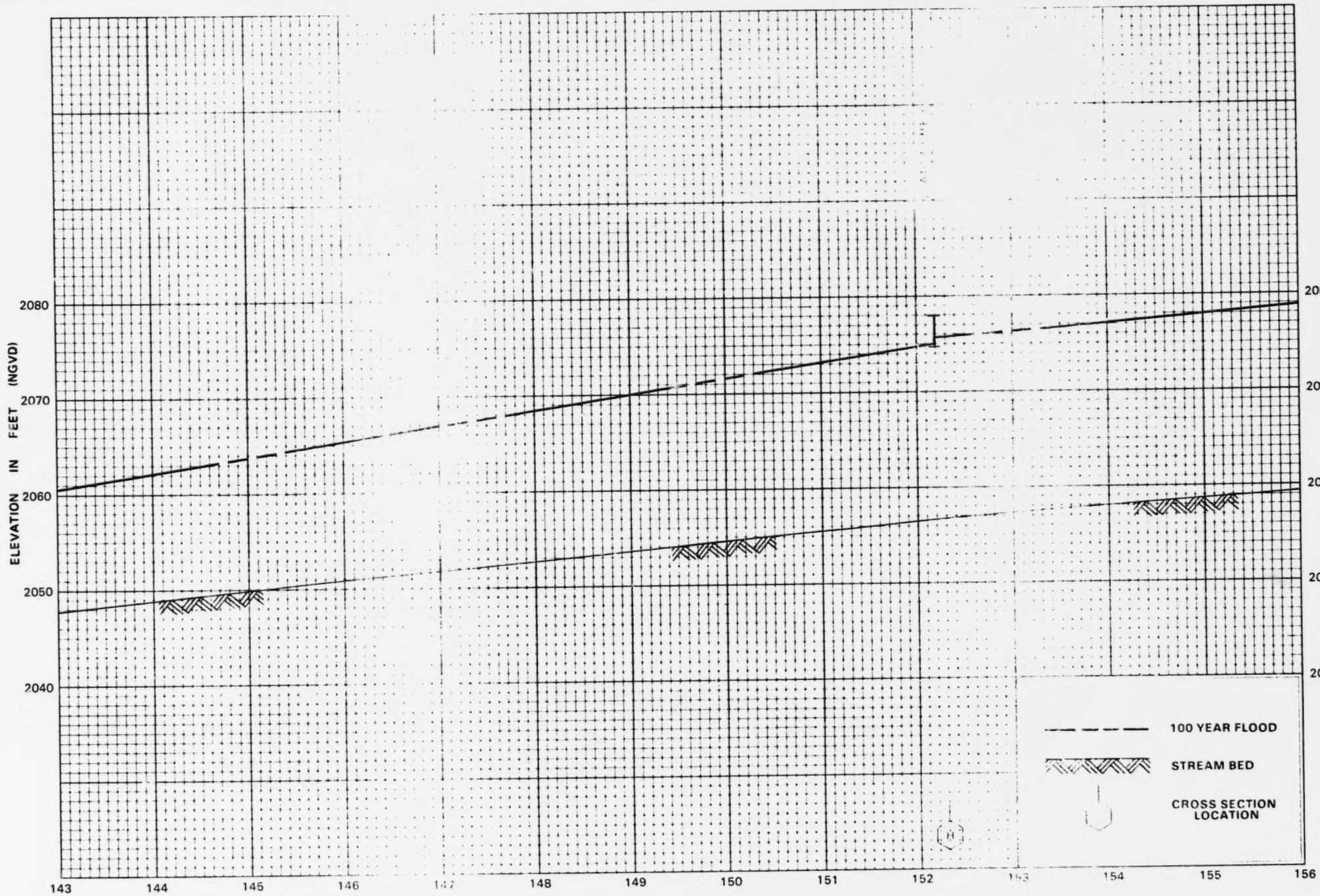
FEDERAL EMERGENCY MANAGEMENT AGENCY

FLOYD COUNTY, VA
(UNINCORPORATED AREAS)

05P

FLOOD PROFILES

LITTLE RIVER (LOWER REACH)



FLOOD PROFILES

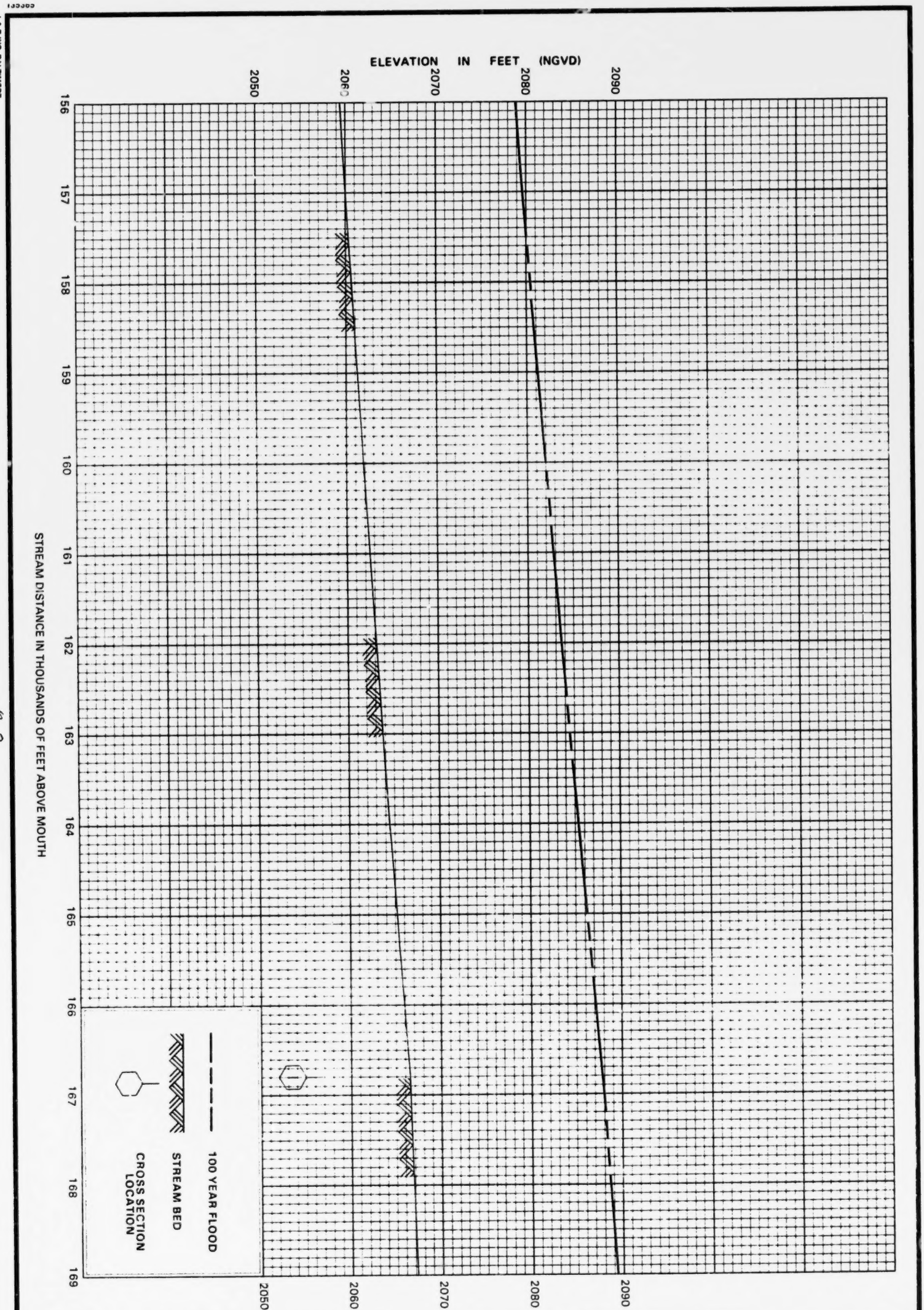
LITTLE RIVER (LOWER REACH)

FEDERAL EMERGENCY MANAGEMENT AGENCY

FLOYD COUNTY, VA
(UNINCORPORATED AREAS)

06P

135365



FEDERAL EMERGENCY MANAGEMENT AGENCY

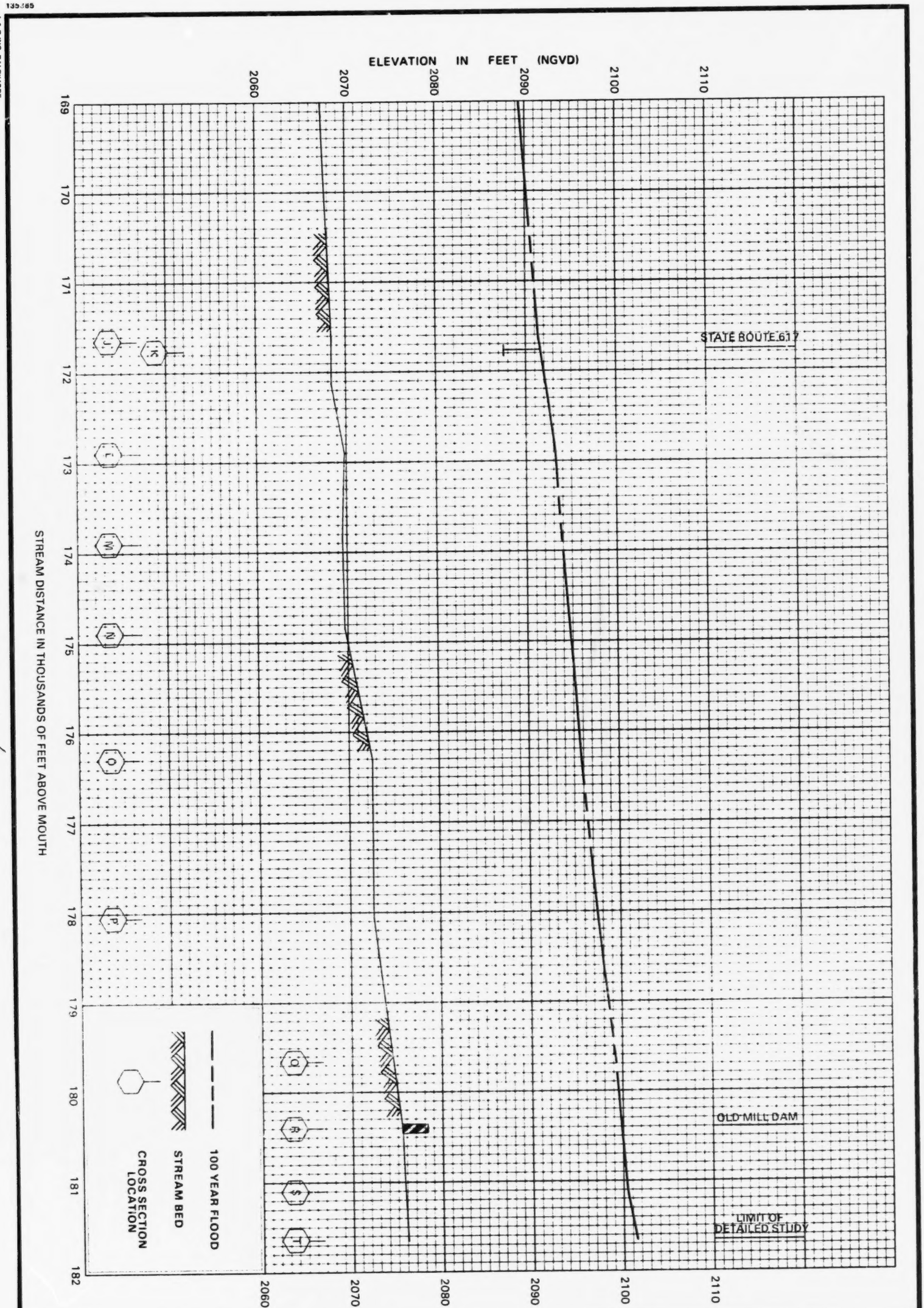
FLOYD COUNTY, VA
(UNINCORPORATED AREAS)

FLOOD PROFILES

LITTLE RIVER (LOWER REACH)

07P

23



FEDERAL EMERGENCY MANAGEMENT AGENCY

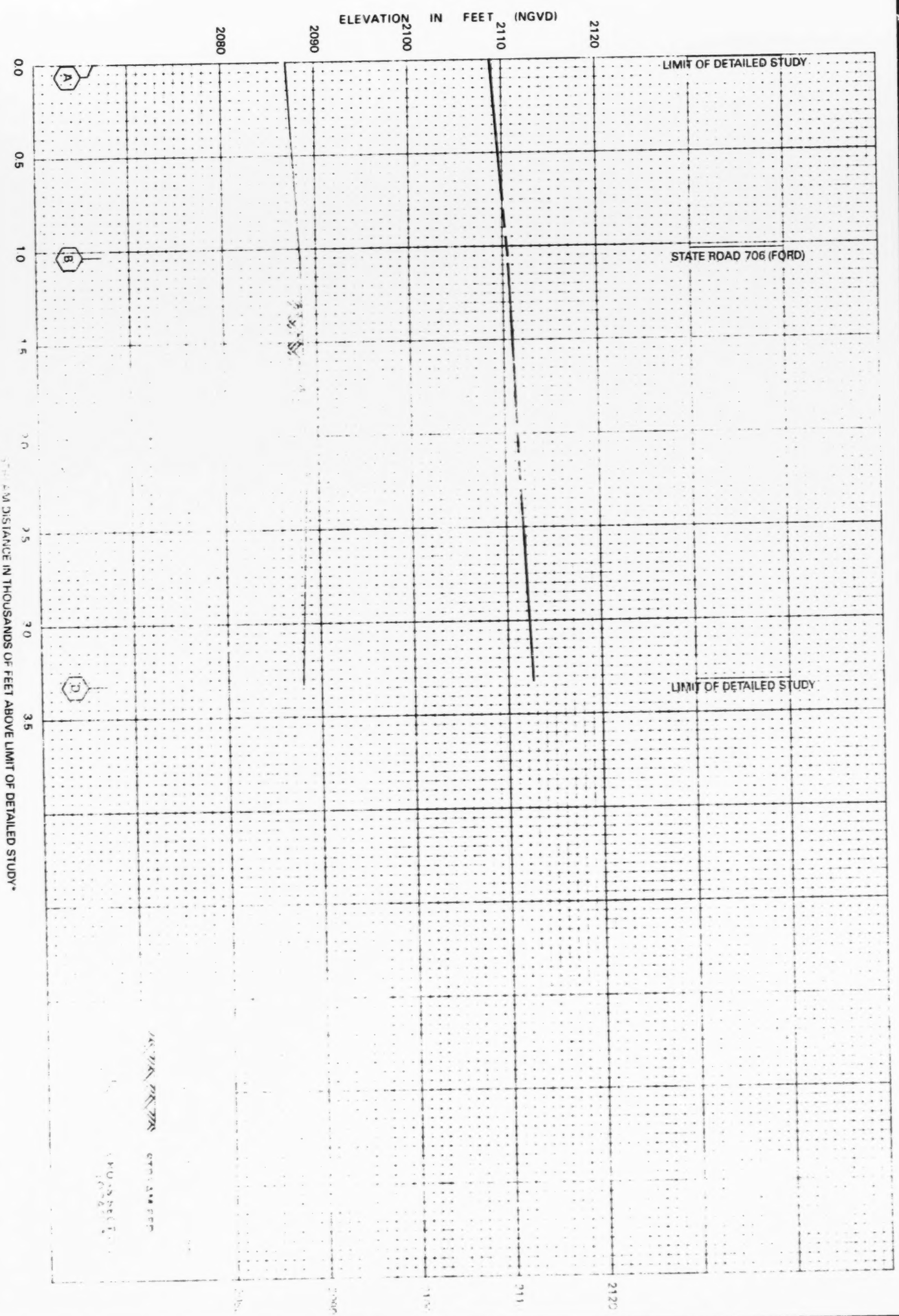
FLOYD COUNTY, VA
(UNINCORPORATED AREAS)

FLOOD PROFILES

LITTLE RIVER (LOWER REACH)

08P

135365



*NOTE: LIMIT OF DETAILED STUDY IS LOCATED APPROXIMATELY 4.4 MILES UPSTREAM OF STATE ROAD 617

23

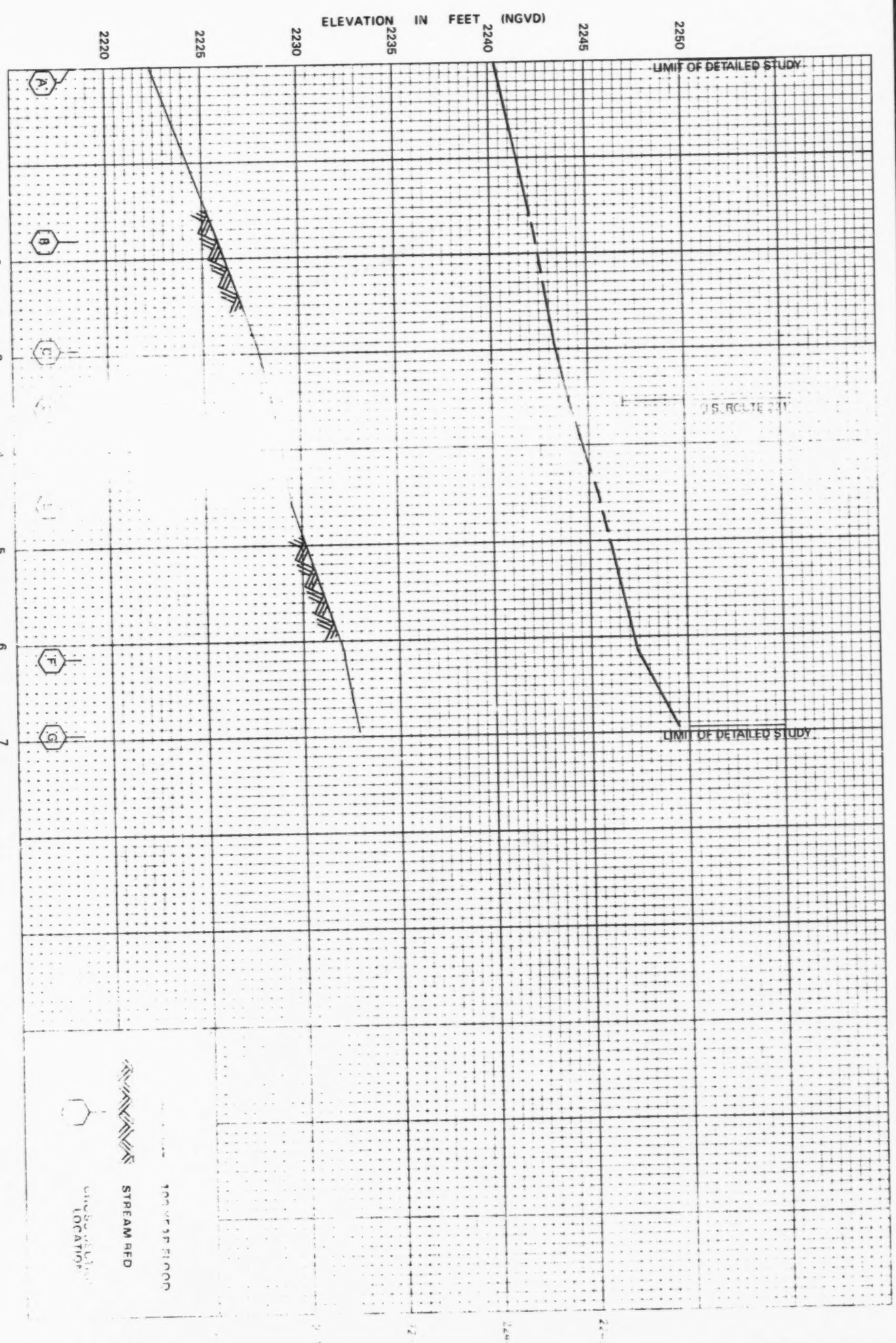
09P

FEDERAL EMERGENCY MANAGEMENT AGENCY

FLOYD COUNTY, VA
(UNINCORPORATED AREAS)

FLOOD PROFILES

LITTLE RIVER (MIDDLE REACH)



*NOTE: LIMIT OF DETAILED STUDY IS LOCATED APPROXIMATELY 3500 FEET DOWNSTREAM OF U.S. ROUTE 221

STREAM DISTANCE IN THOUSANDS OF FEET ABOVE LIMIT OF DETAILED STUDY*

FEDERAL EMERGENCY MANAGEMENT AGENCY

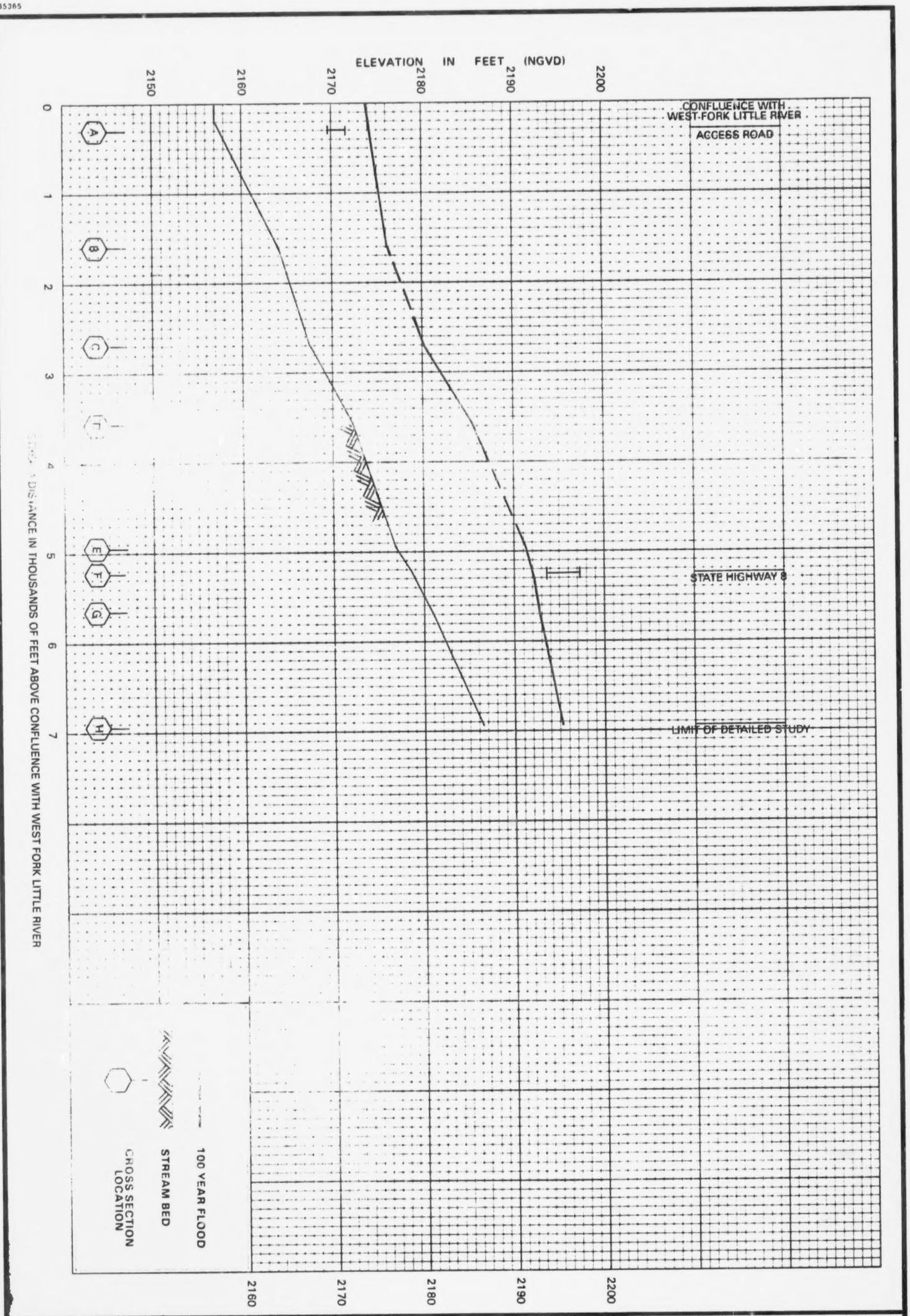
FLOYD COUNTY, VA
(UNINCORPORATED AREAS)

FLOOD PROFILES

LITTLE RIVER (UPPER REACH)

10P

135365



27

FEDERAL EMERGENCY MANAGEMENT AGENCY

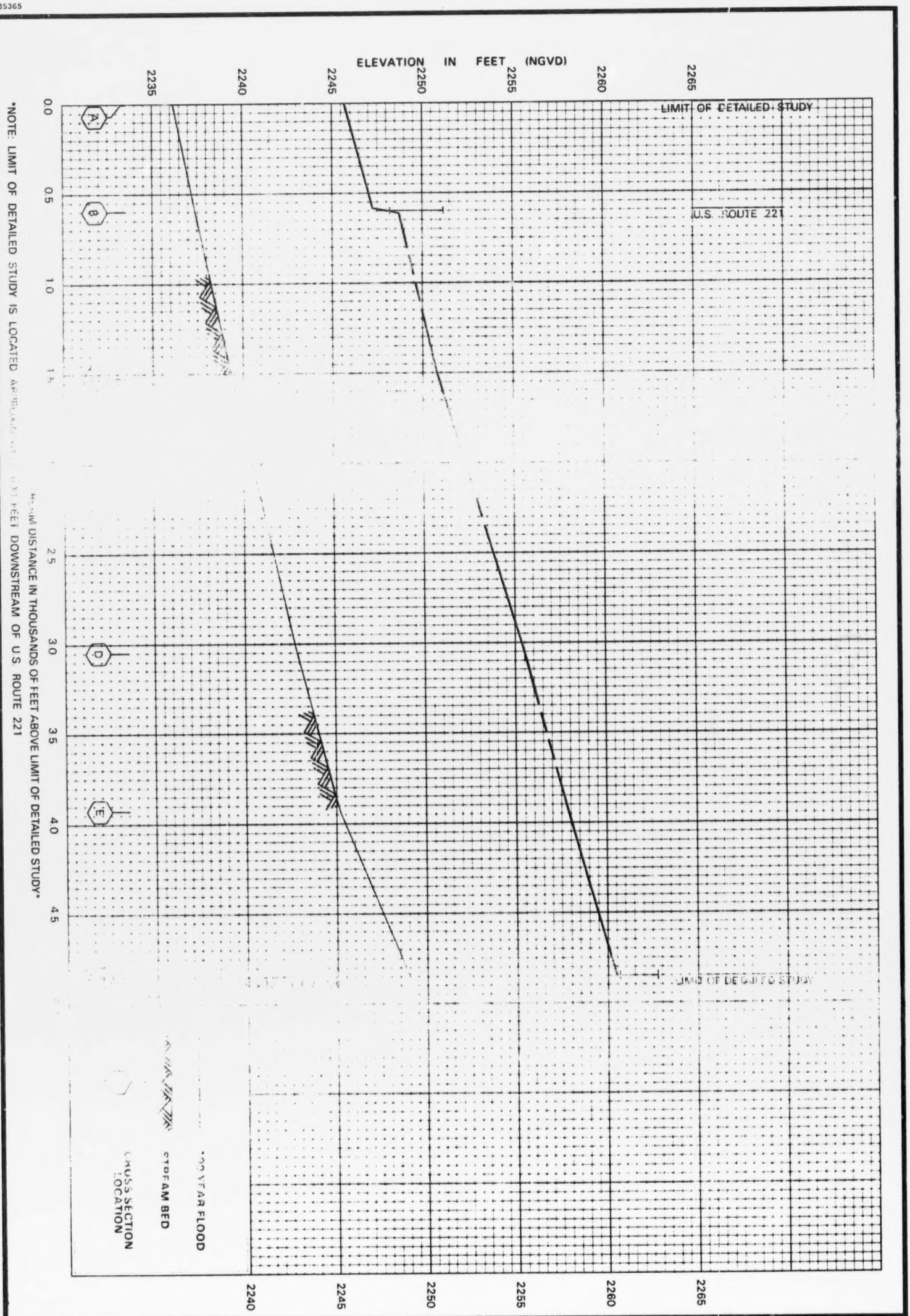
FLOYD COUNTY, VA
(UNINCORPORATED AREAS)

FLOOD PROFILES

DODD CREEK (LOWER REACH)

11P

135365



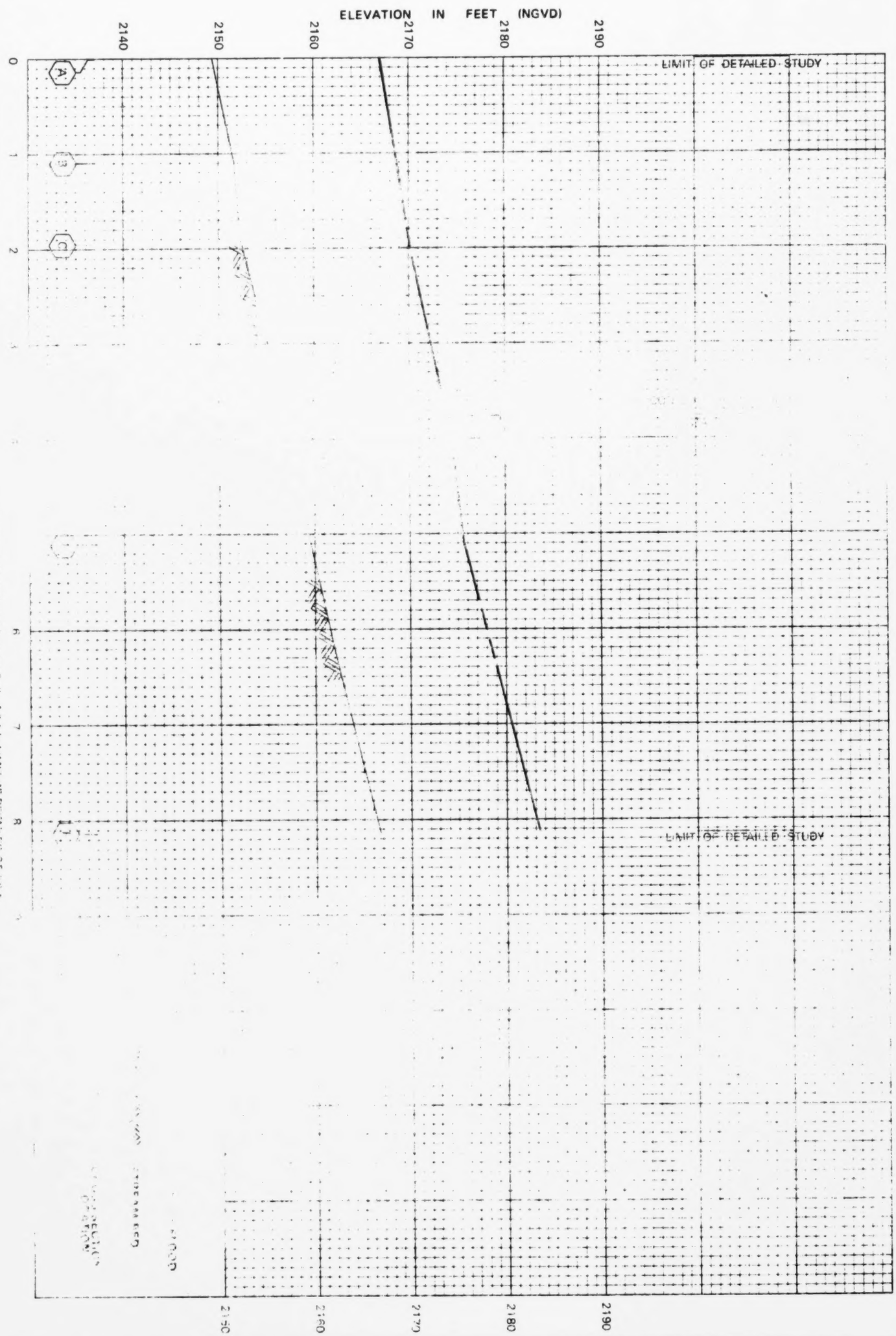
FEDERAL EMERGENCY MANAGEMENT AGENCY

FLOYD COUNTY, VA
(UNINCORPORATED AREAS)

FLOOD PROFILES

DODD CREEK (UPPER REACH)

12P



*NOTE: LIMIT OF DETAILED STUDY IS [illegible] FEET ABOVE CENTERLINE OF STATE HIGHWAY 8

13P

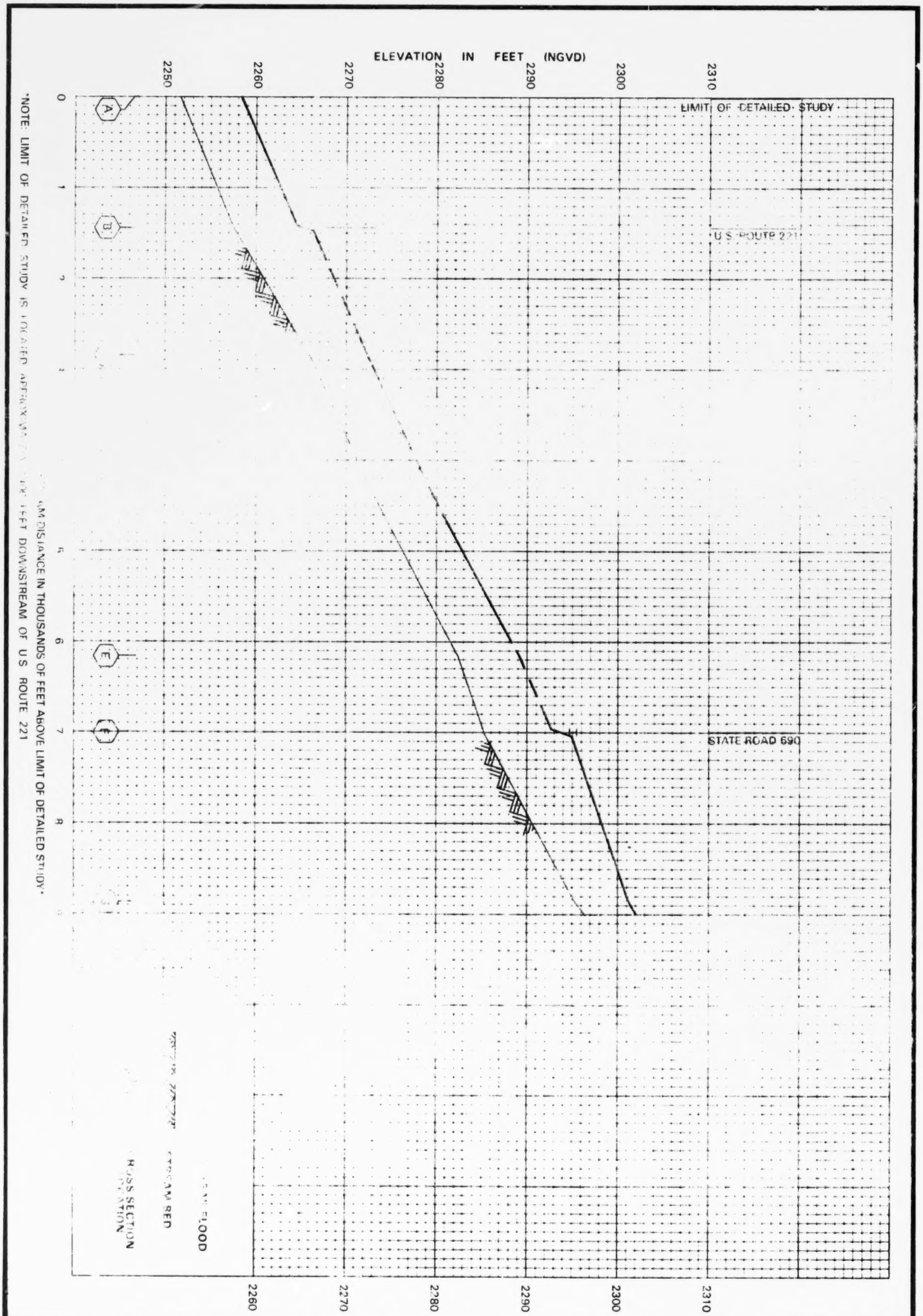
FEDERAL EMERGENCY MANAGEMENT AGENCY

FLOYD COUNTY, VA
(UNINCORPORATED AREAS)

FLOOD PROFILES

WEST FORK LITTLE RIVER

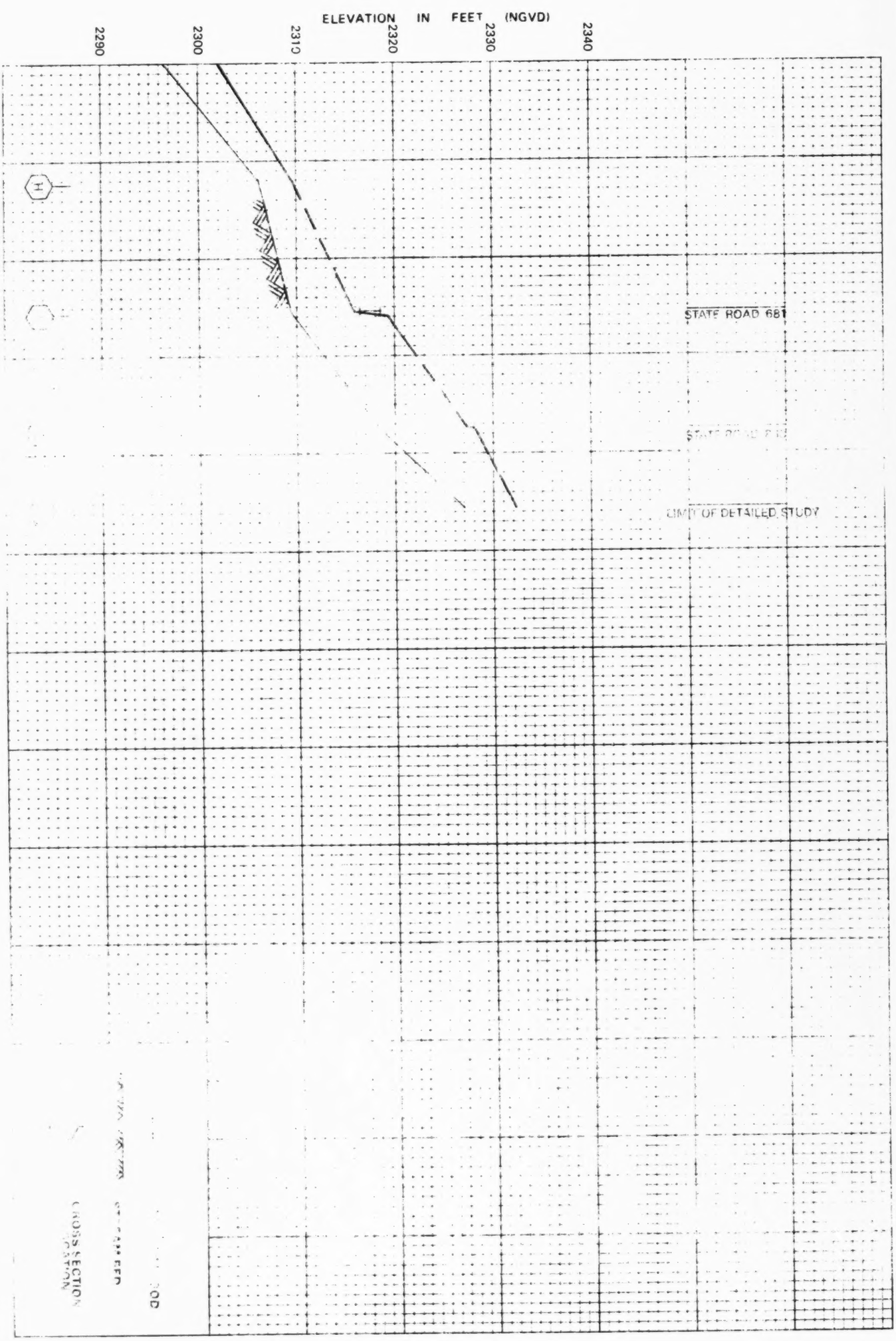
135365



30

14P	FEDERAL EMERGENCY MANAGEMENT AGENCY **FLOYD COUNTY, VA** (UNINCORPORATED AREAS)	**FLOOD PROFILES** **PINE CREEK**

135365



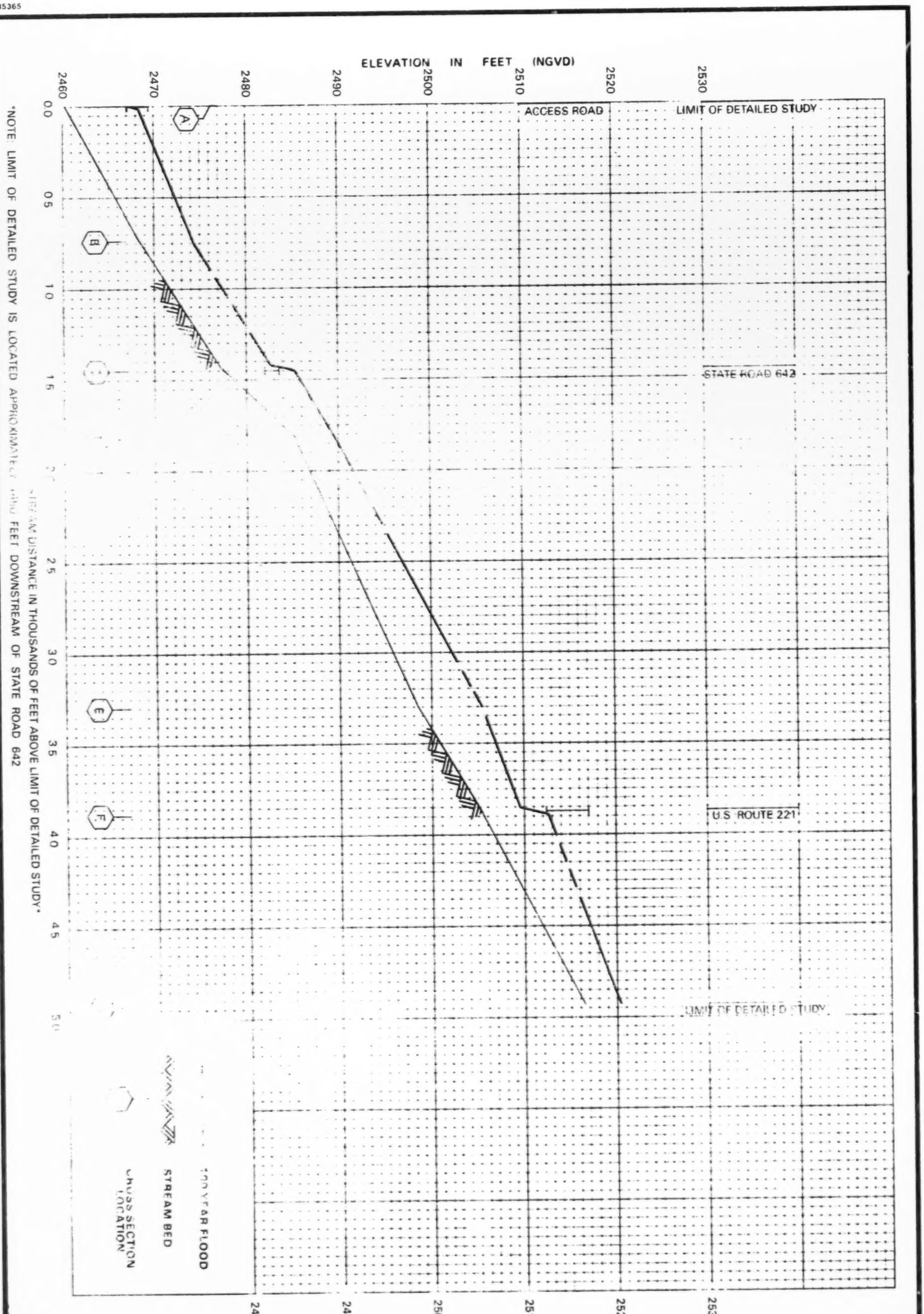
*NOTE: LIMIT OF DETAILED STUDY IS LOCATED APPROXIMATELY [illegible] FEET DOWNSTREAM OF U.S. ROUTE 221

STREAM DISTANCE IN THOUSANDS OF FEET ABOVE LIMIT OF DETAILED STUDY*

31

15P	FEDERAL EMERGENCY MANAGEMENT AGENCY FLOYD COUNTY, VA (UNINCORPORATED AREAS)	FLOOD PROFILES PINE CREEK

135365



16P

FEDERAL EMERGENCY MANAGEMENT AGENCY

FLOYD COUNTY, VA
(UNINCORPORATED AREAS)

FLOOD PROFILES

MEADOW RUN